

central axis of uric acid, whilst, in addition, the ureides of these acids, namely, barbituric acid, dialuric acid, and alloxan, are converted by the ferment quantitatively into urea and carbon dioxide. Moreover, just as in the case of the sugars only the hexoses are capable of undergoing fermentation, the bacillus of uric acid is indifferent to acids containing fewer or more than three carbon atoms.

THE *Psychological Bulletin* (vol. ii., No. 1) for January contains a notice of the meeting of the north central section of the American Psychological Association which was held at Chicago on November 26, under the presidency of Prof. W. D. Scott, of the North-western University. The following papers were read:—Is subjective idealism a necessary point of view for psychology? by Mr. Stephen S. Colvin; the genesis of meaning, by Mr. I. E. Miller; relation of sensation and revived mental processes, by Messrs. T. H. Haines and J. C. Williams; the vehicle of cognition, by Mr. B. H. Bode; psychological method, by Mr. C. A. Blanchard; an Iowa case of complete congenital cataracts cured after twenty-two years, by Mr. James Burt Miner; the relations of psychology to logic, by Miss Harriet S. Penfield; the functional theory in psychology and the concept of transcendence, by Mr. J. H. Farley; the psychology of linguistic development in the individual, by Mr. M. V. O'Shea; is the beauty of art a higher type than that of nature? by Mr. George Rebec; the reality and the symbol in education, by Miss Julia H. Gulliver; and a motor theory of rhythm, by Mr. R. H. Stretton.

THE Walter Scott Publishing Company will shortly issue a translation of "Science and Hypothesis," by Prof. Poincaré. Prof. J. Larmor, Sec.R.S., has written a preface to this edition of Prof. Poincaré's work.

A COPY of the report of the librarian of the U.S. Congress for the fiscal year ending June 30, 1903, has been received from Washington. The report runs to 600 pp., and includes elaborate details concerning every department of the library's activities. A select list of recent purchases during 1901–1903 constitutes part ii. of the volume, and a third section is devoted to a report on copyright legislation.

MR. JOHN A. BERGSTRÖM, of Indiana, writing in the *Psychological Bulletin*, describes a spring suspension for laboratory motors used for driving colour mixing or other experimental apparatus, with the object of reducing the noise and vibration produced by motors resting on a fixed base.

THE third English edition of Prof. Mendeléeff's "Principles of Chemistry" has been published in two volumes by Messrs. Longmans, Green and Co. The new volumes are a translation from the seventh Russian edition by Mr. George Kamensky, edited by Mr. Thomas H. Pope. There are three appendices to the work. The first of these is the Royal Institution lecture delivered by Prof. Mendeléeff on May 31, 1889, entitled "An Attempt to apply to Chemistry one of the Principles of Newton's Natural Philosophy"; the second, on the "Periodic Law of the Chemical Elements," is Prof. Mendeléeff's 1899 Faraday lecture to the Chemical Society; the last is entitled "An Attempt towards a Chemical Conception of the Ether," and its contents were described in an article which appeared in NATURE on November 17, 1904 (vol. lxxi., No. 1829). The work is one of the classics of chemical science, and the new edition will be widely welcomed.

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OUR ASTRONOMICAL COLUMN.

EPHEMERIS FOR COMET 1904 *e*.—Given below is an extract from a daily ephemeris computed by Dr. E. Strömberg from the elliptic elements calculated by M. Fayet for comet 1904 *e*.

		12h. (M.T. Berlin).					
1905		α	δ	$\log r$	$\log \Delta$		
		$h. m. s.$					
Feb. 9	...	2 29 38	... +21 14	...	0.1582	...	0.0816
" 11	...	2 34 23	... +22 27	...			
" 13	...	2 39 14	... +23 38	...	0.1613	...	0.0940
" 15	...	2 44 10	... +24 47	...			
" 17	...	2 49 12	... +25 54	...	0.1647	...	0.1067

On February 7 the comet was very near to, but south-west of, ν Arietis (*Astronomische Nachrichten*, No. 3991, supplement).

EPHEMERIS FOR COMET 1904 *d*.—The following is an extract from the daily ephemeris for comet 1904 *d* published in No. 3991 of the *Astronomische Nachrichten* by Herr M. Ebell.

		12h. (M.T. Berlin).					
1905		α (true)	δ (true)	$\log r$	$\log \Delta$	Bright-	
		$h. m. s.$				ness	
Feb. 9	...	19 22 32	... +54 50	...	0.3492	...	0.82
" 13	...	19 41 49	... +56 28	...	0.3542	...	0.78
" 17	...	20 1 45	... +57 57	...	0.3593	...	0.74
" 21	...	20 22 13	... +59 17	...	0.3645	...	0.70

Brightness at time of discovery = 1.0.

An observation made by Herr Pechüle at 16h. 24.3m. (Copenhagen M.T.) on January 14 gave corrections to this ephemeris of $-4s.$ and $-0'.5$.

On February 9 the comet will be to the north-west of, and near to, κ Cygni, then, travelling in a north-easterly direction, it will pass into the constellation Cepheus.

ORBIT OF COMET 1904 *e* (BORRELLY).—From the observations made at Königsberg on December 31 and at Paris on January 11, M. Fayet has made an investigation of the probable orbit of Borrelly's comet (1904 *e*). In the first place three different sets of parabolic elements were computed, but, although the arc traversed by the comet whilst under observation was very small, and the results obtained were therefore not very trustworthy, the non-agreement of the parabolic elements with the observational results was too great to be admitted. M. Fayet therefore computed a set of elements on the assumption that the orbit was elliptical, and these were much more satisfactory, indicating a short period of about six years.

The following set of elliptic elements was finally adopted as giving a fairly satisfactory agreement between the observed and computed positions:—

$$\begin{aligned} T &= 1905 \text{ Jan. } 15^{\text{h}} 77^{\text{m}} 42^{\text{s}} \text{ (M.T. Paris)} \\ \Omega &= 76^{\circ} 6' 43'' 97 \\ i &= 30^{\circ} 55' 21'' 25 \\ \omega &= 351^{\circ} 35' 27'' 11 \end{aligned} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} 1905$$

$$\log q = 0.149236$$

$$\log e = 9.818195$$

These results give a value for μ of $423''.915$, and therefore indicate that the comet is of the short-period type, making one revolution in its orbit in about eight years (*Comptes rendus*, No. 4, 1905).

OBSERVATIONS OF THE LEONID SHOWER OF 1904.—In a note published in No. 3989 of the *Astronomische Nachrichten*, Mr. Denning gives a few details of his observations of the late Leonid shower at Bristol.

During a watch of about one and a half hours between 13h. 30m. and 15h. 45m. on November 14, 55 meteors, of which 33 were Leonids, were seen, and Mr. Denning estimated that, at that time, the latter were appearing at the rate of about 25 per hour, for one observer, from a radiant situated at R.A. = 151° , decl. = $+23^{\circ}$. No increase

in the horary rate was apparent at 16h., and as the fog became denser the observations were discontinued.

Two of the Leonids seen were as bright as Jupiter, whilst several others were as bright as, or brighter than, first magnitude stars. One of these flashed out in the north-west at 14h. 38m., traversed the path $315^{\circ}+57^{\circ}$ to $318^{\circ}+50\frac{1}{2}^{\circ}$, and left a short streak which lasted for about 30 seconds.

A few slow, yellow meteors from a radiant in Aries at $43^{\circ}+21^{\circ}$, and some swift streaking meteors from a radiant in Leo Minor at $144^{\circ}+37^{\circ}$, were also seen.

SPECTRA OF γ CYGNI, α CANIS MINORIS AND ϵ LEONIS.—In part vii. vol. cxiii. of the *Sitzungsberichte der Kais. Akad. der Wissenschaften*, Herren E. Haschek and K. Kostersitz publish the results of the reductions of the spectra of γ Cygni, Procyon and ϵ Leonis. After discussing in detail the methods of measurement and identification employed in the reduction, and the general and specific characteristics of each spectrum studied, the authors give a table of the wave-lengths and intensities of the lines for each star. The coincidences of each line with lines in the arc and spark spectra of terrestrial elements, as determined by Exner and Haschek, are also given, and in the last column of each table the "probable origins" of many of the lines are set down. Amongst the latter may be noted the rarer elements Yb, Pr, Sa, Nd, La, Pt, Wo, Gd, Eu, &c.

About 140 lines between λ 4250 and λ 4534, 190 lines between λ 4126 and λ 4550, and about 270 lines between λ 4215 and λ 4702 are given in the spectra of γ Cygni, α Canis Minoris and ϵ Leonis respectively.

SYSTEMATIC SURVEY OF DOUBLE STARS.—No. 99, vol. xvi., of the *Publications* of the Astronomical Society of the Pacific is devoted to an address on double stars read before the International Congress of Arts and Sciences at St. Louis by Prof. R. G. Aitken.

After discussing the work already performed in this field, Prof. Aitken described a systematic survey undertaken by Prof. Hussey and himself. All stars down to the ninth magnitude as given in the Bonn Durchmusterung were placed on the observing list, and the sky from the North Pole to -22° declination was equally divided for observation between the two observers.

The programme arranged for the observation of each star on the list on at least one good night, and all double stars discovered with a separation of $5''$ or less were to be measured on at least two nights and catalogued. On September 10, Prof. Hussey had discovered 1035 and Prof. Aitken more than 875 new pairs. Seventy-three per cent. of these are separated by $2''$ or less, and 142 are very close pairs in which the separation does not exceed $0''.25$. Of similar pairs to the latter the previously published catalogues do not contain 100.

Prof. Aitken has examined, during this research, more than 12,000 stars, and finds that the doubles discovered form about 3 per cent. of this total. Including those previously discovered, the ratio of double stars, with distances of less than $5''$, to the whole of the stars down to the ninth magnitude is apparently 1:18 to 1:20. This ratio is not, however, the same for all parts of the sky, for whilst in some regions observed double stars are very scarce, in others the ratio increases to about 1:8.

Other details concerning the survey, its prosecution and the reasons for carrying it out are given in Prof. Aitken's interesting paper.

REPORT OF THE YALE OBSERVATORY, 1900-4.—Dr. Elkin's reports to the board of managers of the Yale University Observatory for the years 1900-4, inclusive, occupy eight pages, and briefly describe the large amount of work performed at the observatory during that period.

Heliometer observations are the chief feature of the work and special attention has been paid to the determination of the parallaxes of stars having large proper motions. Practically all the stars in the northern hemisphere having known motions of $0''.5$, or more, have now been observed at Yale. A second triangulation of the Pleiades and determinations of the parallax of Arcturus have also been made. Another feature of the work is the photography of meteor trails, and numerous trails of meteors from the principal showers have been obtained.

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PRIZE SUBJECTS OF THE BATAVIAN SOCIETY OF EXPERIMENTAL PHILOSOPHY.

AT a recent general meeting of the Batavian Society of Experimental Philosophy of Rotterdam the following subjects were proposed for competition. The gold medal of the society, of the weight of thirty ducats, or its value, will be awarded for the best answer to one or other of the suggested questions. Answers may be written in the Dutch, French, English, German, or Latin languages, in another handwriting than that of the competitor, and must reach the secretary, Dr. G. T. W. Bremer, at Rotterdam not later than February 1, 1906.

Chemistry.—An experimental investigation of the atomic weight of an element which has not yet been satisfactorily fixed; a research on the causes of departure from Ostwald's dilution law; measurements of the osmotic pressure in solutions at concentrations corresponding with deviations from the simple gas laws; a study of the origin and physiological significance of the green pigment in the body of green articulated animals; experiments elucidating the formation and transformations of the sap in india-rubber plants; a re-investigation of the variations from the laws of electrolytic dissociation observed by Kahlenberg in 1901; an explanation of the thallioquinic test for quinine.

Physics.—An investigation of the electrical properties of some metal alloys; of the variation with temperature of the specific heat of mercury; of the specific heat of sulphur and phosphorus in their various allotropic forms; of the indices of refraction of substances showing anomalous dispersion; of the cause of phosphorescence, particularly in the case of the lower organisms.

Biology.—A description of the life-history and properties of one or several species of moulds, ferments, or bacteria which are of industrial importance; the action of sulphur and of copper salts on plant parasites, and of mineral salts on the development of fungi; the rôle of micro-organisms in the formation of humus in the soil.

Physiology.—An investigation of the permeability of red blood corpuscles to the ions of NaCl, NaNO₃, Na₂SO₄; and of the localisation of functions in the cerebellum.

Geology.—An exposition of the theory of the origin of the Netherlands; a critical investigation of the volcanoes of the East Indian Archipelago.

Civil Engineering.—Statistical investigations of the Dutch "polders"; or an investigation of one of the principal rivers of Holland.

THE PIC DU MIDI OBSERVATORY.

IN a recent number of *La Nature*, M. L. Rudaux gave an interesting account of the present condition and operations of this important mountain station. France is well provided with high level stations, and the observations from seven of them are published daily in the *Bulletin International* of the French Meteorological Office. An account of the very favourable position of the Pic du Midi station, and of the almost insuperable difficulties experienced by its original founder, General de Nansouty, was given, in considerable detail, by M. R. Radau, in his useful little work on "Mountain Observatories" (Paris, 1876), and has been summarised by Mr. A. L. Rotch in the *American Meteorological Journal*. The summit, which has an elevation of 2877 metres (the observatory being 17 metres lower), is situated on the outskirts of the Pyrenees, in lat. $42^{\circ} 56' N.$, and long. $2^{\circ} 12' W.$ of Paris, and affords one of the finest views in Europe. Towards the north an immense plain stretches as far as the eye can see, and to the north-west, on very clear days, the blue waters of the Atlantic are visible, at a distance of 160 km. It lies directly in the path of the great atmospheric disturbances which traverse the Bay of Biscay, while the summit mostly enjoys a clear and luminous atmosphere, being some 200 metres above the level at which thunderstorm clouds usually gather. These advantages early attracted the attention of astronomers and scientific men; M. F. de Plantade died in 1741 while observing at the ridge which has since taken his name.

The project of a permanent meteorological station was first mooted in 1860, and provisional observations were com-